

CENTRAL INTELLIGENCE AGENCY

INFORMATION FROM
FOREIGN DOCUMENTS ~~CONFIDENTIAL~~ BROADCASTS

REPORT
CD NO.

COUNTRY . USER .

DATE OF INFORMATION 1948

SUBJECT Coal mining

HOW PUBLISHED Periodical

DATE DIST 6 Dec 1948

WHERE
PUBLISHED

NO. OF PAGES 2

DATE
PUBLISHED March 1948

SUPPLEMENT TO

LANGUAGE Russian

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SOURCE IDENTIFICATION Ugol', No 3, 1948. (FDB Per Abs 62T86 -- Translation specifically requested.)

FIRST RESULTS OF TESTS ON SOVIET COAL CUTTERS

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The first Soviet coal cutter, the US-3, has been in operation for several months at mine No 3 of the Voroshilovogol Trust. It was designed by A. I. Turich and I. M. Baifov and constructed by the Parkhomenko plant in Voroshilovogol. The machine consists of the cutter, two low-speed winches, a portable scraper-conveyor, pneumatic lifting jacks with mechanical racks, and compressor. It operates as follows: the cutter moves up and down along the cut with the aid of the two cables of the winches. The cut is 0.2 meter wide and 0.45-0.65 meter high. The coal thus exposed must be broken off by pressure or manually.

The coal is deposited by the cutter on to the conveyor. With a force of 3.5 tons, the cutter moves along the face of the strike, leaning on the frame of the scraper-conveyor. The conveyor is held in place by the pneumatic jacks on one side and the screw blocks on the other.

Signaling is done electromechanically with the aid of signaling cables. The scraper-conveyor can operate either from the right or left with only a few adjustments. The pneumatic jacks are placed 6-8 meters apart along the length of the conveyor. Angular blocks are mounted on a plate which fits between the roof and floor of the strike with the aid of columns.

In mine No 5, a surface compressor arrangement is used; the air line is conducted through the ventilation connector.

The coal outter was tested in the No 16 west strike of the E5 III "Kavenskiy" layer. The vein was 0.8 meter wide; the angle of dip 8 degrees; the roof was stable (sandstone); the coal was soft (with distinct cleavage), clean, and without streaks or solid inclusions. *

The work was organized in three shifts, two of which engaged in cutting the coal, the other maintenance and preparation. During the operation, the workers were distributed in the following manner: (1) two men at the winches, (2) a machinist who moved behind the cutter to keep it operating normally (in case of difficulties he could make changes with the aid of electrical signals), (3) an electrician, who was in attendance at the strike and winches, (4) two attendants at the angular blocks, (5) three miners in the recesses. (6) one worker to trim the outcrop and to break

- 1 -

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away the ground from its upper portion, (4) men who reinforced the bed and readjusted the mechanical pillars, and (8) chute men who filled the cars. In the production phase, 15-17 men worked in the bed. This number will be decreased in the future.

As a result of the test, it appeared that under the arrangements of the No 16 west strike the cutter easily cut the lower portion of the coal and loaded it on the conveyor. In the part of the outcrop that was not dry, the upper block of coal was broken off by pressure; where it was dry, it was necessary to knock this coal off by other means.

The cutter's work was greatly complicated by the presence of a false top, 0.3-0.5 meter wide, which could not be supported. The false top fell immediately after the passage of the cutter. Large pieces of rock were thrown into the worked portion of the shaft and the cutter's productivity was lowered.

The cutter could separate a layer of coal 100 meters long in 15 minutes. Supplementary work during every cutting operation took up 20-30 minutes. Allowing one hour as the maximum period per layer, the cutter could cut eight layers per shift.

The cutter is especially valuable since it mechanizes one of the most tedious tasks--that of removing the coal from the area in which it is cut.

On the basis of tests in mine No 5, the cutter should be used on soft cleavage coal in the direction of cleavage and close to the line of dip of the shelf. Thus the cutter can operate in the direction of cleavage with a width of the shelf from 0.6 meter and up, an angle of dip up to 20 degrees, a strong and even floor, a stable roof, and absence of solid inclusions and rocks in the bed. The cutter's range of application can probably be expanded in connection with blasting and cross-cutting operations.

The testing of coal cutters in Donbas mines and in anthracite fields will permit a better answer to the application area of these machines. The coal cutters appear to be a new and effective media of mechanizing the cutting and conveying of coal in the mines, as well as eliminating the separate process of notching.

Note: A photograph of the cutter and schematic diagrams of the machine are available in the original document at CIA.]

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- 2 -

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